Space Weather Forecast

Issued on Sunday, 23 July 2023 at 13:15 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Chance of Moderate-class flares and R1/R2 blackouts throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, although a large Common-class flare was observed at 23/0454 UTC from a relatively large and complex region in the northwest. There are currently 7 other regions on the Earth facing disc, with a new region currently appearing round the southeast limb. This may reveal more complexity as it comes further into view. There are two other relatively large regions on opposing sides of the solar disc, but these have a simpler magnetic structure and have stayed the same or shown signs of decay. All other regions remain small or simple, with no significant change observed.
Two Coronal Mass Ejections (CMEs) that left the northeast quadrant of the Sun late on the 22nd have been analysed and are thought not to be Earth directed, along with a third CME which left the north earlier in the day. A fourth CME can be seen leaving the northwest early on the 23rd. This is unlikely to have an Earth directed component but are awaiting further imagery for confirmation.

Solar Wind / Geomagnetic Activity: The solar wind parameters measured at L1 suggests connection to a weak coronal hole high speed stream. Speeds were slightly elevated between 400 and 470 km/s. Total magnetic field strength has been weak, with weak fluctuations in the north-south component. Geomagnetic activity has been Quiet (Kp 0-2)

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) are at background levels with no radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Moderate with an ongoing chance of isolated Moderate-class flares, most likely from the large and complex region in the northwest.

Solar Wind / Geomagnetic Activity: No Earth directed CMEs currently feature in the forecast. Further fast winds from a coronal hole are forecast to connect with the Earth either late on 23 or during 24 Jul, with speeds around 450-550km/s likely. Mainly Quiet to Unsettled geomagnetic activity is expected, with a chance of Active intervals late on the 23 into the 24 Jul and slight chance of a Minor Geomagnetic Storm.

Energetic Particles / Solar Radiation: The count rate of energetic particles is expected to remain at background with only a very slight chance of rising. Radiation storms are currently not expected.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.

Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	10	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.